

# Risk Analysis

Vol. 11, No. 1

March 1991

---

## CONTENTS

### IMPORTANT ANNOUNCEMENT

- Chevron Postdoctoral Fellowship in Risk Analysis 3

### EDITORIALS

- Human Exposure to Chemicals from Multiple Media and through Multiple Pathways: Research  
Overview and Comments 5  
*Thomas E. McKone*
- A Usually Unrecognized Source of Bias in Cancer Risk Estimations 11  
*James D. Wilson*

### LETTERS TO THE EDITOR

- It's Safer to Fly 13  
*Arnold Barnett*
- Risk Perception 15  
*Aaron Wildavsky*
- Response to Barnett 17  
*Leonard Evans, Michael C. Frick, and Richard C. Schwing*

### WORKSHOP ON HAZARDOUS WASTE

- Managing Hazardous Waste: Past, Present, and Future 19  
*Howard Kunreuther*
- The Importance of the Technical Characteristics of Hazardous Materials in Considering Environmental Risk 27  
*Ruth Patrick*
- Comments on "The Importance of the Technical Characteristics of Hazardous Materials in Considering Environmental Risk" 31  
*Michael Gough*
- Comments on "The Importance of the Technical Characteristics of Hazardous Materials in Considering Environmental Risk" 33  
*Ellen Silbergeld*
- Technology Forecasting as a Risk Management Tool 35  
*Thomas J. Tuffey*
- Comments on "Technology Forecasting as a Risk Management Tool" 41  
*Elizabeth L. Anderson*
- If Only We Could Make It All Go Away: The Technology Challenge for Hazardous Waste 43  
*John W. Wilson*
- Public Perception of Hazardous Waste 47  
*Susan G. Hadden*
- Comments on "Public Perception of Hazardous Waste" 59  
*Mark Jaffe*

Comments on "Public Perception of Hazardous Waste"	61
<i>I. Rosenthal</i>	
Cleanup of Old Waste: Some Thoughts on Rethinking the Fundamentals of Superfund	63
<i>Gene A. Lucero</i>	
Comments on "Cleanup of Old Waste: Some Thoughts on Rethinking the Fundamentals of Superfund"	69
<i>Dennis Connolly</i>	
Cleanup of Old Wastes: Is Superfund Broke?	71
<i>Milton Russell</i>	
Strategies for Managing Present and Future Wastes	75
<i>Marcia E. Williams</i>	
Comments on "Strategies for Managing Present and Future Wastes"	81
<i>Paul Arbesman</i>	
Comments on "Strategies for Managing Present and Future Wastes"	83
<i>Richard C. Fortuna</i>	
Capturing Superfund's Potential: Ideas on the Federal Cleanup Program and Environmental Law-Making Generally	89
<i>Seth Mones</i>	
Superfund: Bad Administration or Bad Law? A Critique of Seth Mones' "Capturing Superfund's Potential"	101
<i>Leslie Cheek, III</i>	
Comments on "Capturing Superfund's Potential"	103
<i>Don Strait</i>	
Synthesis of Conference on "Minimizing Environmental Damage: Strategies for Managing Hazardous Waste"	107
<i>Don R. Clay</i>	
ARTICLES	
An Evaluation of the Rai and Van Ryzin Dose-Response Model in Teratology	111
<i>Gregory J. Carr and Christopher J. Portier</i>	
Protective Responses to Household Risk: A Case Study of Radon Mitigation	121
<i>James K. Doyle, Gary H. McClelland, William D. Schulze, Steven R. Elliott, and Glenn W. Russell</i>	
Cancer Fatalities from Waterborne Radon (Rn-222)	135
<i>Douglas J. Crawford-Brown</i>	
Nonstop Flying Is Safer Than Driving	145
<i>Michael Sivak, Daniel J. Weintraub, and Michael Flannagan</i>	
Stochastic Analysis of Intermediate Lesions in Carcinogenesis Experiments	149
<i>E. Georg Luebeck and Suresh H. Moolgavkar</i>	
SOFTWARE REVIEW	
DETECT	159
<i>Ronald G. Whitfield and Jack C. VanKuiken</i>	
BOOK REVIEWS	
<i>Robin K. White</i>	163
ERRATUM	
<i>James K. Hammitt</i>	167

---

# Risk Analysis

Vol. 11, No. 2

June 1991

---

## CONTENTS

### EDITORIAL

- Total Risk Management 169  
*Yacov Y. Haimes*

### PERSPECTIVE

- Risk Communication Challenges 173  
*Ann Fisher*

### LETTERS TO THE EDITOR

- Joint Risk from Multiple Compound Exposure 181  
*T.R. Auton*
- Reply to T.R. Auton's Letter to the Editor 185  
*James J. Chen, David W. Gaylor, and Ralph L. Kodell*
- The Risks of Economic Modeling Before Establishing the Causal Inference 187  
*Peter Sinsheimer*

### EUROPEAN SECTION SOCIETY OF RISK ANALYSIS

- Introduction: Risk Assessment and Communication in a Changing Europe 189  
*Ray Kemp and Timothy O'Riordan*
- The Dependence of the Risk of Research Reactors from Their Operating Schedule—A Case Study 191  
*John G. Kollas*
- Elicitation of Decision-Makers' Preferences for Management of Major Hazards 199  
*P. Hubert, M.H. Barry, and J.P. Moatti*
- The Seveso Directive: An Italian Pilot Study in Enabling Communication 207  
*Bruna De Marchi*
- Risk Prevention and Policy-Making in Automatic Systems 217  
*Louis H.J. Goossens*
- Information Needs Concerning a Planned Waste Incineration Facility 229  
*Peter M. Wiedemann, Hans Peter Peters, and Holger Schütz*
- Applications of Probabilistic Risk Assessments: The Selection of Appropriate Tools 239  
*Joanne Linnerooth-Bayer and Björn Wahlström*
- More Large Accidents Through Complexity? 249  
*Petter Wulff*

### ARTICLES

- Public Perception of the Risks of Floods: Implications for Communication 255  
*Tamara R. Lave and Lester B. Lave*

Fishing a Superfund Site: Dissonance and Risk Perception of Environmental Hazards by Fishermen in Puerto Rico <i>Joanna Burger and Michael Gochfeld</i>	269
General Deterrence of Drunk Driving: Evaluation of Recent American Policies <i>William N. Evans, Doreen Neville, and John D. Graham</i>	279
Do Faster Rescues Save More Lives? <i>Tony K. Quon and Jan A. Laube</i>	291
What Risks Are People Concerned About? <i>Gregory W. Fischer, M. Granger Morgan, Baruch Fischhoff, Indira Nair, and Lester B. Lave</i>	303
Worry Over Technological Activities and Life Concerns <i>Donald MacGregor</i>	315
Predicting EPA's Forthcoming CO Standards in Light of New Clinical Evidence <i>John D. Graham and David R. Holtgrave</i>	325
A Note on the Influence of Rail Defects on the Risk Associated with Shipping Hazardous Materials by Rail <i>Sue McNeil and Sei-Chang Oh</i>	333
Parametric Distributions for Soil Ingestion by Children <i>Kimberly M. Thompson and David E. Burmaster</i>	339
SOFTWARE REVIEW	
A Review of FaultREASE Version 1.0 <i>Robert W. Youngblood</i>	343
Response to "A Review of FaultREASE Version 1.0" by Robert W. Youngblood <i>Gregory Wilcox and Paul A. Croce</i>	349
BOOK REVIEWS <i>Robin K. White</i>	351

---

# Risk Analysis

Vol. 11, No. 3

September 1991

## CONTENTS

### PERSPECTIVES

- Benzene Risk Assessment: Status of Quantifying the Leukemogenic Risk Associated with the Low-Dose Inhalation of Benzene 355  
*Peter E. Voytek and Todd W. Thorslund*
- Expected Values for Projected Cancer Risks from Putative Genetically Acting Agents 359  
*Dale Hattis and Robert L. Goble*

### LETTERS TO THE EDITOR

- Response to Fritz A. Seiler 365  
*Stein Haugen and Jan Erik Vinnem*
- Comments on Chesson *et al.* 367  
*Kenny S. Crump*
- Response to Crump 371  
*Jean Chesson*
- What is the Risk? 373  
*John T. Barr*
- Comments on "Background Exposure to Chemicals: What IS the Risk?" 375  
*Douglas W. Kononen and Richard C. Schwing*

### INDIA WORKSHOP PAPERS

- Environmental Risk Analysis: An Overview 377  
*M. P. Singh and Curtis C. Travis*
- Dispersion of Toxic Combustion Products from Large Fires 381  
*D. A. Carter*
- Quantified Risk Assessment of Petrochemical Installations and Pipelines in the United Kingdom 385  
*D. A. Carter*
- Emergency Preparedness in the Indian Nuclear Power Stations 389  
*A. R. Sundararajan*
- Integration of Risk Assessment with Reliability Concept: A Case Study of a Paper Mill 393  
*A. W. Deshpande, R. S. Olaniya, and P. Khanna*
- Research Requirements in Major Hazards Risk Analysis 399  
*R. F. Griffiths*
- Some Models for Analysis of Hazards and Justification for Investment 405  
*S. Ramani and H. F. Finlay*
- Risk Analysis of a Gas-Processing Complex in India 409  
*R. K. Garg and A. A. Khan*
- Atmospheric Dispersion of Inflammable Substances for Estimating Vulnerable Zones in Hydrocarbon Industry 419  
*Manju Mohan, M. P. Singh, and T. S. Panwar*

Estimation of Vulnerable Zones Due to Accidental Release of Toxic Materials Resulting in Dense Gas Clouds	425
<i>M. P. Singh, Manju Mohan, T. S. Panwar, and H. V. K. Chopra</i>	
Sampling Strategies for Toxic Air Contaminants	441
<i>S. Trivikrama Rao, Jia-Yeong Ku, and K. Shankar Rao</i>	
ARTICLES	
Biological Basis of Chemical Carcinogenesis: Insights from Benzene	453
<i>Louis Anthony Cox, Jr.</i>	
Human Health Risks Associated with Asbestos Abatement	465
<i>Paul C. Chrostowski, Sarah A. Foster, and Elizabeth L. Anderson</i>	
Additive and Multiplicative Relative Risk in the Two-Stage Clonal Expansion Model of Carcinogenesis	483
<i>Ralph L. Kodell, Daniel Krewski, and Jan M. Zielinski</i>	
Time- and Loading-Dependence in the McKone Model for Dermal Uptake of Organic Chemicals from a Soil Matrix	491
<i>David E. Burmaster and Nancy Irwin Maxwell</i>	
The Accident Evolution and Barrier Function (AEB) Model Applied to Incident Analysis in the Processing Industries	499
<i>Ola Svenson</i>	
Estimation of Maximum Tolerated Dose for Long-Term Bioassays from Acute Lethal Dose and Structure by QSAR	509
<i>Vijay K. Gombar, Kurt Enslein, Jeffrey B. Hart, Benjamin W. Blake, and Harold H. Borgstedt</i>	
Risk, Ambiguity, Insurance, and the Winner's Curse	519
<i>Jeryl L. Mumpower</i>	
A Prescriptive Risk Framework for Individual Health and Safety Decisions	523
<i>Ralph Keeney and Detlof von Winterfeldt</i>	
A Multistage Model of Carcinogenesis Incorporating DNA Damage and Repair	535
<i>C. J. Portier and A. Kopp-Schneider</i>	
SOFTWARE REVIEW/LISTINGS	
Risk Analysis Software and Databases: Review of Riskware '90 Conference and Exhibition	545
<i>Ronald J. Marnicio, P. J. Hakkinen, Steven D. Lutkenhoff, Richard C. Hertzberg, and Paul D. Moskowitz</i>	
BOOK REVIEWS	561
<i>Robin White</i>	

---

# Risk Analysis

Vol. 11, No. 4

December 1991

## CONTENTS

### PERSPECTIVE

- A Perspective on Biologically-Based Approaches to Dioxin Risk Assessment 565  
*William F. Greenlee, Melvin E. Andersen, and George W. Lucier*

### LETTERS TO THE EDITOR

- Response to Tollefson *et al.* 569  
*F. Terry Hearne*
- Response to Hearne 573  
*Linda Tollefson, Robert N. Brown, Ronald J. Lorentzen, and Janet A. Springer*
- Comments on Predicting EPA's Forthcoming CO Standards in Light of New Clinical Evidence 575  
*John W. Tukey and Andrew Sivak*
- Comments on Predicting EPA's Forthcoming CO Standards in Light of New Clinical Evidence 577  
*Jane Warren and Thomas E. Dahms*
- Comments on Incorporating Mechanistic Data into Quantitative Risk Assessment 581  
*Clay B. Frederick and Alan G.E. Wilson*

### ARTICLES

- Mathematical Modeling of Reproductive and Developmental Toxic Effects for Quantitative Risk Assessment 583  
*Ralph L. Kodell, Richard B. Howe, James J. Chen, and David W. Gaylor*
- The Repeatability of Uncertainty and Sensitivity Analyses for Complex Probabilistic Risk Assessments 591  
*Ronald L. Iman and Jon C. Helton*
- Knowledge and Risk Perception Among Nuclear Power Plant Employees 607  
*Lennart Sjöberg and Britt-Marie Drott-Sjöberg*
- Estimating the Value of Avoiding Morbidity and Mortality from Foodborne Illnesses 619  
*Josephine A. Mauskopf and Michael T. French*
- A Study of the Shape of Dose-Response Curves for Acute Lethality at Low Response: A "Megadaphnia Study" 633  
*Jeanne L. Sebaugh, James D. Wilson, Michael W. Tucker, and William J. Adams*
- Modeling Benzene Pharmacokinetics Across Three Sets of Animal Data: Parametric Sensitivity and Risk Implications 641  
*Robert C. Spear, Frédéric Y. Bois, Tracey Woodruff, David Auslander, Jennifer Parker, and Steve Selvin*
- An Approach to Assessing the Impacts of Incident-Free Transportation of Radioactive Materials: I. Air Transportation 655  
*Ruth F. Weiner, Patrick A. LaPlante, and John P. Hageman*
- An Approach to Assessing the Impacts of Incident-Free Transportation of Radioactive Materials: II. Highway Transportation 661  
*Ruth F. Weiner, Patrick A. LaPlante, and John P. Hageman*
- Incentives Policies to Site Hazardous Waste Facilities 667  
*Robin Gregory, Howard Kunreuther, Doug Easterling, and Ken Richards*



Planning Replacement of Natural Gas Distribution Systems Under Constraints on Acceptable Risk from Explosions <i>Francis Noonan</i>	677
Perceived Risk, Stigma, and Potential Economic Impacts of a High-Level Nuclear Waste Repository in Nevada <i>Paul Slovic, Mark Layman, Nancy Kraus, James Flynn, James Chalmers, and Gail Gesell</i>	683
Comments on "Perceived Risk, Stigma, and Potential Economic Impacts of a High-Level Nuclear Waste Repository in Nevada" <i>Gilbert W. Bassett, Jr. and Ross C. Hemphill</i>	697
Reply to Bassett and Hemphill <i>Paul Slovic and James Flynn</i>	701
SOFTWARE REVIEW	
A Review of HAZOPTimizer <i>David J. Hesse</i>	703
SOFTWARE LISTING <i>Paul D. Moskowitz</i>	705
BOOK REVIEWS <i>Robin K. White</i>	707

---



